# MAXWELL IRRIGATION DISTRICT

# GROUNDWATER MANAGEMENT

# PLAN

## Adopted

## May 25, 2004

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(INSERT PICTURE OF RICE FIELD/WELL,ETC.)

## INTRODUCTION

Efficient use of the water resources available in the Sacramento Valley and the State of California has become more exacting as competition for water grows and a greater emphasis is placed on conjunctive use and management of both surface water and groundwater. In order to better understand the groundwater resource available and prevent deterioration in groundwater quality and land subsidence, it is imperative to address the management of groundwater basins. Equally important, is to know what influence certain activities within and outside an area exert on the underlying groundwater basin.

## Assembly Bill 3030

In 1992, legislative action was taken by the California State Assembly to address groundwater management in the state. Assembly Bill 3030 (Water Code Sections 10750-10755) provides the legislative authority for local water agencies to establish and implement programs to manage groundwater resources within their respective service areas. The process by which a groundwater management plan can be prepared and implemented is very specific. The components of a groundwater management plan, as outlined in AB3030 (Water Code Section 10753.7) include the following:

1. Control of saline water intrusion
2. Identify and manage wellhead protection areas and recharge areas
3. Regulate the migration of contaminated groundwater
4. Administer a well abandonment and well destruction program
5. Mitigate conditions of overdraft
6. Replenish groundwater extracted by water producers
7. Monitor groundwater levels and storage
8. Facilitate conjunctive use operations
9. Identify well construction policies
10. Construct and operate the contamination cleanup, recharge, storage, conservation, water recycling and extraction projects
11. Develop relationships with federal and state regulatory agencies
12. Review land use plans and coordinate with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

## AB3030 Schedule For Adoption And Implementation

On January 14, 2003, following its public hearing, Maxwell Irrigation District (MID) adopted a Resolution of Intention to Draft a Groundwater Management Plan (Plan) pursuant to Water Code Section 10753, et. seq. The schedule for the process is set forth on Table 1.

## MAXWELL IRRIGATION DISTRICT

The Maxwell Irrigation District (MID) was formed in 1918 and exists under the Irrigation District Law, Division 11 of the California Water Code, commencing with Section 20500. The purpose of MID is to provide water for irrigation. In order to do this, levees were constructed around the perimeter and a drainage system was constructed inside the

levees to capture and discharge natural runoff. The landowners of the District are represented by a five member Board of Directors (Board). The Board, utilizing the expertise of and coordination with M B K Engineers has drafted this plan and will be responsible for its implementation, monitoring and updating. The Plan area includes all lands within MID. As MID proceeds with perfecting this Plan, it intends to determine if adjacent areas may wish to join with MID in implementing a coordinated groundwater management plan for an enlarged area.

## The Plan Area – MID Service Area and Distribution System:

MID is located within the Sacramento Valley, approximately 10 miles northeast of the City of Williams, approximately 17 miles southeast of the City of Willows, and approximately 10 miles west of the City of Colusa. A small portion of MID, approximately 500 acres, is located east of the Colusa Drain near the northern boundary of the Delevan National Wildlife Refuge and south of the main east/west canal leading from the Sacramento River to the Colusa Drain. The major portion of MID is bounded on the east by the Colusa Drain and on the west, north, and south by the Glenn-Colusa Irrigation District. A portion of MID's northern boundary is shared with the Delevan National Wildlife Refuge.

## Water Source and Supply

MID's water rights are as follows: (1) licensed appropriative water rights; and (2) water rights under Agreement dated June 2, 1953, supplemented July 16, 1954, by and between seven irrigation districts and Reclamation District 2047 (Seven Party Agreement); and (3) a July 6, 1972, contract entitled "Contract between the United States of America and

Maxwell Irrigation District, Diverter of Water from the Sacramento River sources, providing for Project Water Service and Agreement on Diversion of Water" ( "Bureau Contract") These Bureau contracts provide MID with a base supply of 11,980 acre-feet (AF) which can be diverted during April through October, a project supply of supplemental water of 6,000 AF during July and August (total of 17,980 ). The District has obtained permit to divert Sacramento River water during the non-irrigation season for wetlands and rice straw decomposition.

## The Distribution and Discharge System

MID has a state-of–the-art fish screened pumping facility (constructed in 1994) on the right bank of the Sacramento River. Water is diverted from the river into MID's main canal, which travels approximately four miles to the first diversion point, which serves approximately 500 acres on the east side of the Colusa Drain. Historically, the main canal delivered water into the Colusa Drain upstream of a dam structure that provided the control to deliver water into MID's main canal traveling southerly on the west side of the Colusa Drain through the Delevan National Wildlife Refuge to the main part of MID's service area. In 1999, MID completed an inverted siphon facility and now has the capability to convey its Sacramento River water under the Colusa Drain and deliver it into the main canal that travels through the Delevan National Wildlife Refuge. From the head of the canal, leading from the structure on the Colusa Drain, water travels southerly through the Delevan National Wildlife Refuge approximately 5 miles to MID's main pumping plant located on the south side of the County Road 3. The main pumping plant is near the eastern boundary of the service area. At this location there are six pumps with one pump delivering water to the east to approximately 180 acres. The remaining five

pumps deliver water to a canal that parallels Maxwell Road to the west in order to supply the major portion of the District's service area. All water that is either not pumped at MID's main pumping plant or tailwater from irrigation within MID flows and discharges into the Colusa Drain, and becomes part of the water supply for downstream users.

## Land Use

MID serves approximately 29 landowners. These landowners are stakeholders of MID, a special district, as well as ratepayers. There are approximately 6,796.8 assessed acres within MID, and approximately 6150.5 farmable acres are served by MID's distribution system. Most of the land within MID is devoted to agricultural (rice), but a substantial portion is also used for waterfowl habitant ponds of hunting clubs. There are only a few residences (hunting lodges) within the boundaries of MID, and there are no commercial or industrial developments. Map #1 identifies land use within Maxwell Irrigation District boundaries.

## Rice Crop

Rice is the major crop grown within MID's service area. Rice typically accounts for approximately 80 percent of the irrigated acreage on an annual basis. As is the case with most of the other water providers in the Central Valley, water requirements are typically highest during the summer months (July and August) due to the requirements of rice, as well as the area's hot, dry climate. Cultural practice water needs for rice are greatest early in the growing season, associated with the flooding of rice fields for planting. Annual rice patterns have remained fairly constant over the last few decades, other than

in response to farm programs in the early 1980's. As a result, water requirements and associated diversions have therefore been more a function of water year type and climate than changes in cropping.

### Rice Straw Decomposition and Wetlands Habitat

In response to increasingly stringent limitations on burning, some of the rice-growing landowners flood portions of their fields to decompose leftover rice straw. Approximately 4,500 acres have been flooded for decomposition purposes in the past, a trend that is expected to continue or increase assuming that the other options (including the sale of stubble for ethanol production) are not determined to be more economically feasible. This practice provides additional winter habitat for waterfowl above that which has been available within the Sacramento Valley since the development of agriculture. Future irrigation season cropping patterns and associated water requirements are anticipated to remain relatively the same as current conditions. Land use changes that allow high-density or heavy commercial water use might increase the overall water requirements, though highly unlikely

## GOALS AND OBJECTIVES

The goals and objectives of Maxwell Irrigation District, which guided the formulation of this groundwater management plan, are presented below.

### Goals

- Assure an adequate water supply, both in terms of quantity and quality, for the water users within the district, in a manner that is efficient, economical and environmentally sound.

- Manage the use of surface water and groundwater resources available to the district for maximum benefit to the water users within the district, without adversely affecting the underlying groundwater basin.

## Objectives

- Increase the understanding of all aspects of the district's underlying groundwater basin
- Coordinate the acquisition, compilation, and evaluation of groundwater data and management of the groundwater basin with districts or agencies having jurisdiction over adjacent lands

### THE GROUNDWATER BASIN

Maxwell Irrigation District lies within the Colusa Subbasin, the largest single subbasin in the Sacramento Valley Groundwater Basin. The subbasin is along the west side of the basin and is bordered on the west by the Coast Range, on the North by Stony Creek, on the east by the Sacramento River and on the south by Cache Creek. Sacramento River Settlement Contractors within the Colusa Subbasin Include:

- Glenn Colusa Irrigation District
- Provident Irrigation District
- Princeton-Codora-Glenn Irrigation District
- Maxwell Irrigation District
- Reclamation District 108

The SRSC service areas are shown in Map 2.

The Colusa Subbasin aquifer system is composed of continental deposits of late Teritiary to Quaternary age. The Quaternary age deposits include alluvial and flood basin deposits, and deposits of the Modesto and Riverbank formations. The Tertiary deposits include the Tehama Formation and the Tuscan Formation. The main water-bearing formation in the Colusa Subbasin is the Tehama Formation.

The Tehama Formation is different in the northern and southern portions of the subbasin. In the northern subbasin, the formation contains extensive deposits of interbedded gravel from the ancestral Stony Creek. These deposits are informally referred to as the Stony Creek Member of the Tehama Formation. The Stony Creek Member of the Tehama Formation is typically productive, yielding a large quantity of water to wells. In the southern Colusa Subbasin, the Tehama Formation is less productive, although isolated zones of high production do occur.

The Tuscan Formation is an important water-bearing unit in the northeastern portion of the Colusa Subbasin, although at present it is not significantly used. The Tuscan Formation enters the Sacramento Valley along the eastern margin of the Butte Subbasin. Extending 15 miles westward, the formation dips beneath the Colusa Subbasin as it interfingers with the Tehama Formation at depths between 300 and 1,000 feet. Estimates of the depth to the Tuscan Formation in this area are based on preliminary date from investigations performed by DWR.

Natural recharge consists of infiltration from precipitation and surface water and from groundwater underflow from the western and eastern margins of the subbasin. Significant recharge also occurs from the application and percolation of irrigation water. Seasonal fluctuations in the groundwater level are minimal and generally less than about 10 feet (DWR 1996)

## THE GROUNDWATER MANAGEMENT PROGRAM

Taking into consideration the current level of understanding of the groundwater basin underlying MID, and the practical aspects of limited financial resources, the Groundwater Management Program (Program) will focus efforts in implementing an initial phase of priority components. These priority components will lead to the determination of

relevance and then priority of the remaining components addressed in Water Code Section 10753.7 and set forth in the later phase.

## Initial Phase

Section 10753.7 of the Water Code identifies 12 components that may be included in a groundwater management plan adopted under the authority set forth I Section 10753. Although all components are important in varying degrees, MID has prioritized 3 components from a review of the total 12. The following are those deemed to be the most important, which will lead to the determination of the subsequent components most relevant to further improving the management of the groundwater basin.

### Monitoring and Storage Program California Water Code Section 10753.7(g)

MID previously had no groundwater wells within its boundaries, but has just completed the process of developing two groundwater wells via DWR agreement #4600002444. Therefore, groundwater monitoring for Maxwell Irrigation District currently consists of two newly installed monitoring wells. One of the wells is located on the northwest corner of the northern portion of the district and the other is on the northern edge of the southern district boundary. In addition, the Department of Water Resources measures about forty wells in Colusa County. The DWR wells throughout Colusa County are a mixture of domestic and irrigation wells of varying depths. All of the wells are measured by DWR during spring, summer, and fall of every year.

Map 3 shows the locations of MID wells and the DWR wells that are nearest to MID. Figures 1 & 2 in the Appendix show groundwater elevation data since 1974 for two of the neighboring wells.

During 2003, DWR assisted MID with the installation of two irrigation wells and the two monitoring wells shown on Map 3. The monitoring wells were installed next to each irrigation well and are triple completion wells with extensometers. Each triple completion monitoring well has three separate screened intervals for measuring groundwater levels and groundwater quality from three discrete aquifer zones. Each monitoring well completion is also an extensometer with the capability of measuring subsidence to (+) or (–) 0.005 feet. Groundwater levels and subsidence data are measured on a daily basis by the use of electronic data loggers installed at each site.

**Conjunctive Use, California Water Code Section 10753.7(h)**

MID will continue to develop its conjunctive use programs.

Landowners are encouraged to first purchase and use available surface water supplies and only use groundwater supplies when supplemental supplies are necessary. MID has existing water delivery facilities in place to serve its landowners.

**Development of Relationships with State and Federal Regulatory Agencies, California Water Code Section 10753.7(k)**

MID has developed ongoing working relationships with the DWR, USBR, US Army Corp of Engineers, US Fish and Wildlife, SWRCB and the California Regional Water Quality Control Board. MID will work with other State and Federal regulatory agencies when appropriate to protect the groundwater basin.

**Task Elements of the Priority Components**

Table 2 outlines MID's priority task element components.

## Later Phase(s)

The components of a groundwater management program which are not deemed to be a priority may be implemented individually over time in combination with those priority components already underway in the Initial Phase.

### The Control of Saline Water Intrusion, California Water Code Section 10753.7(a)

If monitoring of groundwater should find saline degradation, MID will develop a method of control to change the gradient so that the lower quality of water does not flow into the aquifer. This may be accomplished in several ways:

- Reduction of extraction from aquifer
- Recharging the aquifer with good quality water
- Importing surface water to use in lieu of ground water.

MID would cooperate with existing agencies to ensure that wells in the basin are constructed, renovated, and demolished so that they do not become conduits for contamination of the aquifer. The Program will include cooperation with and participation in waste discharge programs, an understanding of the relationship between land use and discharge of pollutants, and groundwater contamination. MID recognizes the Colusa County standards of 2,500 parts per million of total dissolved solids as the maximum contaminate level for action to abandon a well or take appropriate corrections.

**Wellhead Protection Areas and Recharge Areas, California Water Code Section 10753.7(b)**

MID will cooperate with existing agencies that have jurisdiction for determining if contamination of the groundwater basin is occurring as a result of wellhead and/or recharge contamination. The Plan's Wellhead Protection Program (WHP) may alleviate the adverse conditions by implementation of various programs as follows:

- Form a committee of participants and determine the roles of various state agencies, local governments and public water suppliers. The committee should prepare a summary and purpose describing how the WHP goals will be achieved.
- Delineation of Wellhead Protection Areas (WHPAs) based on reasonable available hydrogeologic information on groundwater flow, recharge and discharge, and other information deemed necessary to adequately determine the WHPAs.
- Identification of potential sources of contamination within each WHPA. Current, past, and future land uses will be considered when developing the contamination source history.
- Develop management approaches to protect the groundwater from contaminants, including technical and financial assistance, implementation of control measures, education, training, and demonstration projects.

- Develop contingency plan to provide alternate water supply in case of well or wellfield becomes contaminated.
- Develop a participation program so that landowners and staff can be involved throughout the planning process

**Regulating Contaminant Migration in Groundwater, California Water Code Section 10753.7(c)**

If monitoring data resulting from implementation of MID's Initial Phase indicate contaminant migration into the groundwater basin, the Plan will assist other agencies to:

- Identify any current and past users of hazardous materials, and verify proper storage and disposal of hazardous materials.
- Develop a program to work with Regional Water Quality Control Board, Department of Toxic Substance Control, and other federal and state agencies to control, cleanup and dispose of these materials

**Well Abandonment and Well Destruction Program, California Water Code Section 10753.7(d)**

Existing agencies have jurisdiction for implementing and enforcing provisions of the Water Code with respect to the abandonment and destruction of wells. MID will assist the various agencies as appropriate, to determine such wells. If it is determined that there are wells requiring such attention, the Plan will accept the minimum standards set forth in California Water Code Sections 13700 through 13806 requiring proper destruction of wells. Local County permitting process administrates these standards. There may

become a need to site-specifically augment well construction or destruction standards to control or mitigate pumping impacts on surface water or on movement of groundwater quality constituents. Depending on the importance of such considerations, MID's Plan will be expanded to incorporate them as appropriate.

**Mitigation of Groundwater Overdraft, California Water Code Section 10753.7(e)**

The well monitoring activity in the Initial Phase will facilitate the determination of overdraft conditions. MID will implement such measures as deemed appropriate. The Plan could consider actively using surface water in times of surplus to replenish the basin, and develop conjunctive use programs structured to do the same replenishment. The Plan intends to work with DWR in continuing the groundwater quality monitoring program and to supplement this program to investigate any local concerns.

**Replenishment of Groundwater, California Water Code Section 10753.7(f)**

Groundwater extraction by the District and individual water producers not replenished each year over a period of years should be determined by monitoring levels in MID's Initial Phase. If necessary as indicated by monitoring data, MID will implement a program to assess local geology to determine the areas or sites where surface water may be most efficiently percolated into groundwater. Replenishment of the groundwater basin will be accomplished in one of the following ways:

- Through natural percolation of surface water through the soil
- The delivery of surface water to spreading grounds or basins which are maintained to allow maximum percolation into the groundwater

- Through injection of surface water into the ground water basin through injection wells.

**Identify Well Construction Policies, California Water Code Section 10753.7(i)**

MID well development construction are to DWR specifications. MID accepts the minimum standards set forth in Water Code Section 13700 through 13806, which continue to be administrated by the State. Existing agencies have jurisdiction for implementing and enforcing provisions of the water code with respect to the construction of wells. MID will assist the various agencies if from monitoring and evaluating data obtained in the Initial Phase such activities are necessary.

**Construction and Operation of Groundwater Management Facilities, California Water Code Section 10753.7(j)**

Groundwater extraction projects – all diverted water within MID is subject to diversion and use only by and through MID. No landowner or consumer has any proprietary rights, or acquires and proprietary rights to water supplied by MID by reason of applying for or using such water, or any right to resell the water applied for or used, or the right to use it on promises or for purposes other than for which it was applied and as stated in the application. MID retains the all rights to recapture, reuse, and resell all waters that passes from premises described in the application as the place of use, and asserts its right to control the use of all diverted water within MID. A landowner within MID may transfer all or portion of the landowner's water allocation from MID for use within MID, so long as the transfer does not result in injury to other MID landholder, and provided MID gives

its prior written consent to such transfer, which consent shall not be unreasonably withheld.

**Land Use and Water Supply, California Water Code Section 10753.7(l)**

The Plan will review land use and coordinate with city, county, and state governmental agencies to identify and ensure that any potential risk for contamination is fully mitigated. MID will evaluate any proposed land use or zoning changes from the standpoint of the risk of deterioration in the quality of groundwater.